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IV.—*Some Account of the Natron Lakes of Egypt; in a Letter to W. R. Hamilton, Esq.* From Sir GARDNER WILKINSON.

On the Nile, Jan. 18*th*, 1842.

As I have lately had an opportunity of examining a part of Egypt which has, I believe, hitherto been imperfectly laid down in the maps of that country, I beg you to do me the favour to lay before the Geographical Society the following observations on the Natron Lakes and the Bahr-el-Fargh, with the accompanying survey of that district:—

The usual route from the Nile to the Natron Lakes or Wady Natrún is from Teráneh, and a march of 12 hours is calculated as the distance from that place to the village of Zakúk, the most northerly inhabited spot in the Natron Valley. The road, on quitting the Nile, passes at the distance of about 1½ mile over the ruins of an ancient town, which have of late years been turned up in every direction for the purpose of collecting the nitre that abounds in the mounds of the old towns of Egypt. These ruins are of great extent, and apparently, from the burnt bricks and small decomposed copper coins occasionally found amongst them, of Roman times. Some columns, one of which is about 2½ feet in diameter, have also been met with, but no object of value has presented itself to indicate a town of much consequence, and it is therefore probable that its size was rather owing to its having been the abode of the many persons employed in bringing the natron to the Nile than to the importance it possessed as an Egyptian town. This opinion is further confirmed by the appearance of a large road leading to it from the south end of the Natron Valley, which is still followed by those who go from this part of the country to the Convent of St. Macarios.

The distance from Teráneh to Zakúk is about 38 miles, as measured by the pace of my camels and a pocket pedometer. This I have found to be an excellent instrument when compared with the camel's pace, though not altogether to be depended upon alone, as it varies in consequence of inequalities of ground and some other accidental causes, which cannot always be accurately allowed for. The road, on reaching the summit of the low hills that skirt the desert, continues upon a high plain with a slight ascent towards the W., varied by occasional hollows or undulations of ground for about 20 miles, and then descends as gradually for a distance of 8 miles more, when it arrives at the ridge of the Natron Valley, to which the descent is much more rapid, though of no very great depth. It is however evidently lower than the Valley of the Nile, and, judging by the eye as well as my barometer, a sensible difference exists between it and the plain of Egypt at Teráneh. Of three barometers which I brought to

Egypt, one only remained uninjured, which I took with me on this occasion, but even in this the mercury was not quite secure by the time I had reached Zakúk; and as the escape of a small quantity may render my observations not quite accurate, I have some scruples as to giving their results.

The village of Zakúk stands on the site of what is marked in Colonel Leake's map as an ancient glass-house, which is still visible beneath, and close to the house built about 12 years since by the Europeans who first established works there for drying the natron, and who founded this village, which now contains fifty or sixty huts and about 200 inhabitants of both sexes. The glass-house was probably of Roman times. It is built of stone and the scoria of common green glass; and pieces of the fused substance attached to the stones sufficiently indicate its site, as the rounded summits the form of three distinct ovens. The natron is found in the plain and in two or three of the lakes. It is principally taken from El Gúnfadíh and El Hámra Lakes. Two others, El Khortái and the lesser Mellahat é Jún, also produce this salt, but being very small they yield little, and the last is only frequented by the Arabs, who smuggle it to the Nile chiefly by the road through the Fyúm.

There are eight lakes which contain water all the year, and are called Mellahat (*Salinæ*). The largest and most southerly, called Om Risheh, produces only muriate of soda, or common salt. Next to this in size is e' Jaár, also a salt lake; then El Gúnfadíh and El Hámra, both of which produce natron; then the larger Jún and e' Rasúníeh, two salt lakes; and last of all, El Khortái and the lesser Jún, which two contain natron, and are much less than the preceding. There are two ponds or birkets, the Birket e' Shugaïfeh, and the Birket e Rumáïd, which contain water the greater part of the year, but are dry in summer; and a few other pools not worthy of notice, some of which contain natron of a bad quality.

In the lakes that yield natron and muriate of soda, the two salts crystallize separately; the latter above in a layer of about 18 inches thick, and the natron, varying in thickness according to the form of the bed of the lake, the thinnest being about 27 inches. All the lakes contain muriate of soda, though few produce natron; but I could not hear of any that yield sulphate of soda.

The water in the lakes varies much in height at different seasons of the year. March is the period when they are highest, and then they are all full. They begin to increase about the end of December, and continue to rise till the commencement of March, when they gradually decrease, and in May all the pools, and even the two larger birkets, are perfectly dry. The abundance of water in winter renders them less salt than in the subsequent months; and even the height of the Mellahats diminishes greatly in summer, leaving the dry parts covered with an incrustation of muriate of soda or of natron, according to the nature of the salt they contain. The difference between the beds of the Birkets and those of the Mellahats, or salt and natron lakes, consists in those of the former, when the water has evaporated, being a muddy deposit, and of the two latter a firm incrustation; and it is at this time that the natron called Soltani is collected.

The natron consists of two kinds, the white and the Soltani, the latter taken from the bed of the lakes as the water retires, the former from the low grounds that surround them, which are not inundated. This last is the best quality. It is prepared for use at the village by first washing and dissolving it in water, and then exposing it to the sun in an open court, from which it is removed to the ovens and placed over a fire in a large trough, till all the moisture is extracted; it is then put into a dry place to be carried to the Nile for exportation to Europe; the Soltani being taken in the state in which it is found direct to Cairo.

On measuring the specific gravity of the water, that of the lakes containing natron and salt is found to contain 35 kirât in summer, immediately before it dries up, and in January and February about 24 keerât, the well-water of the village of Zakúk measuring 1, and that of the Nile zero; indeed there are several springs of fresh water in the Natron Valley; the purest of which are at the convents to the S.; that of Deïr Baramus being slightly salt. The water evidently rises from and reposes on a bed of clay, which I found close to Zakúk and at the base of the hills to the westward; and I have no doubt from what I observed here and at the Oases, that it filters beneath the mountains that separate the Wady Natrún from the Nile, and being carried over the clay which constitutes the base of the Libyan chain, finds an exit in these low valleys, forming springs of fresh water in places where the soil is free from all saline matter, and salt springs, or ponds of natron when the earth through which it passes from the clay presents these substances deposited in one of the neighbouring strata. This is the case in many parts of Egypt; and in support of this opinion, I need only state, that the water of all its salt wells becomes much sweeter when a great quantity has been taken out, proving the water itself to be originally fresh and rendered salt by contact with earth containing saline matter.

It seems singular that the water of these lakes should begin to rise so long after the high Nile, a period of nearly three months. This can only be explained by the slowness of its passage through the strata of the mountains intervening between the river and this distant valley; and judging from the time the Nile water takes to ooze through the alluvial deposit of its banks to the edge of the desert (frequently not more than a mile or two off), the time taken to reach the Natron Valley appears to be proportionate to the increase of distance.

The dip of the strata of the hills that border the Natron Valley is towards the N.E.; hence the descent to the two valleys (the Wady Natrún and the Wady-el-Fargh) is more rapid on the W. than the E., and this is consistent with the lower level of the former valley.

The Wady Natrún contains a very small population, the village of Zakúk and the four convents having altogether not more than 272 inhabitants; the village, as before stated, 200, and the convents 72; of which Dëir Suriani claims 30, St. Macarios 22, Amba Bishoi 13, and Baramús 7. The inmates of all these convents, or rather monasteries, are Copts, each with a Gommos or superior, though the Baramús is said to be of Greek, as the Suriani of Syrian origin.

Besides natron, this valley produces rushes (Sumár) and bullrushes (Bírdi) used for making the well known mats of Egypt, which tend so much to the comfort of the Caïrenes. Of the former the best kind of mats are made, called Menúfi, from the town where they are manufactured; of the latter, those of an inferior quality and most commonly used in the houses of Cairo, the Menúfi being principally confined to the houses of the rich. It is not, however, to the Natron Valley that Menúfi is indebted for the best rushes; those of El Maghra or Wady e' Sumar, "the Valley of Rushes," are greatly superior, and are brought across the desert expressly for this purpose. Wady e' Sumar is on the road to Siwah, and is 4 days from the Nile and 3 days from the Natron Lakes. The Natron Valley produces no trees. Some of the usual herbs of the desert, a few tamarisk bushes near the Deïr Baramús, some stunted palms in the same direction, and others to the E. of St. Macarios, are the only vegetable productions, besides its reeds and rushes; and no attempt to rear the palm to the height and character of a tree has succeeded, owing no doubt to the many kinds of salt that corrupt the soil. The animals are the gazelle, jerboas, foxes, and a few others common to the Libyan hills; but I could find no one who had seen or heard of the stag, said by some travellers to frequent this district, and which is represented in the paintings of ancient Egypt as an inhabitant of the country.

The length of the Wady Natrún is about 22 miles, and its breadth, reckoning from the slope of the low hills that surround it, 5½ miles in the broadest part, though the actual level plain is not more than 2 miles, and is here and there studded with isolated hills and banks of rock covered with sand. The ascent towards Bahr-el-Fargh is very gradual, and the descent to that valley is even more rapid than that of the eastern side of the Wady Natrún; but the latter is deeper than its western neighbour, though inferior to it both in breadth and length. The hills that separate the two valleys are covered with rounded siliceous pebbles, pieces of petrified wood, and coarse gritstone mixed with loose sand, which are likewise found on the low banks that form the undulating ground of the Bahr-el-Fargh, the rocks that skirt it being a coarse sandstone. These agatised woods are mostly palm, a knotted tree, perhaps of a thorny kind, and a pointed stem resembling a cane, precisely the same as those that are found on the opposite side of the Nile on the summit of the Mokattam range behind Cairo. The pebbles and woods have probably been imbedded in a friable layer of sandstone, which having been decomposed has left these heavier bodies upon the surface of the stratum next beneath it, while its lighter particles carried off by the wind have contributed not a little to increase the quantity of sand in these districts; and indeed the rock immediately below is of a texture scarcely more compact than that which I suppose to have been thus removed.

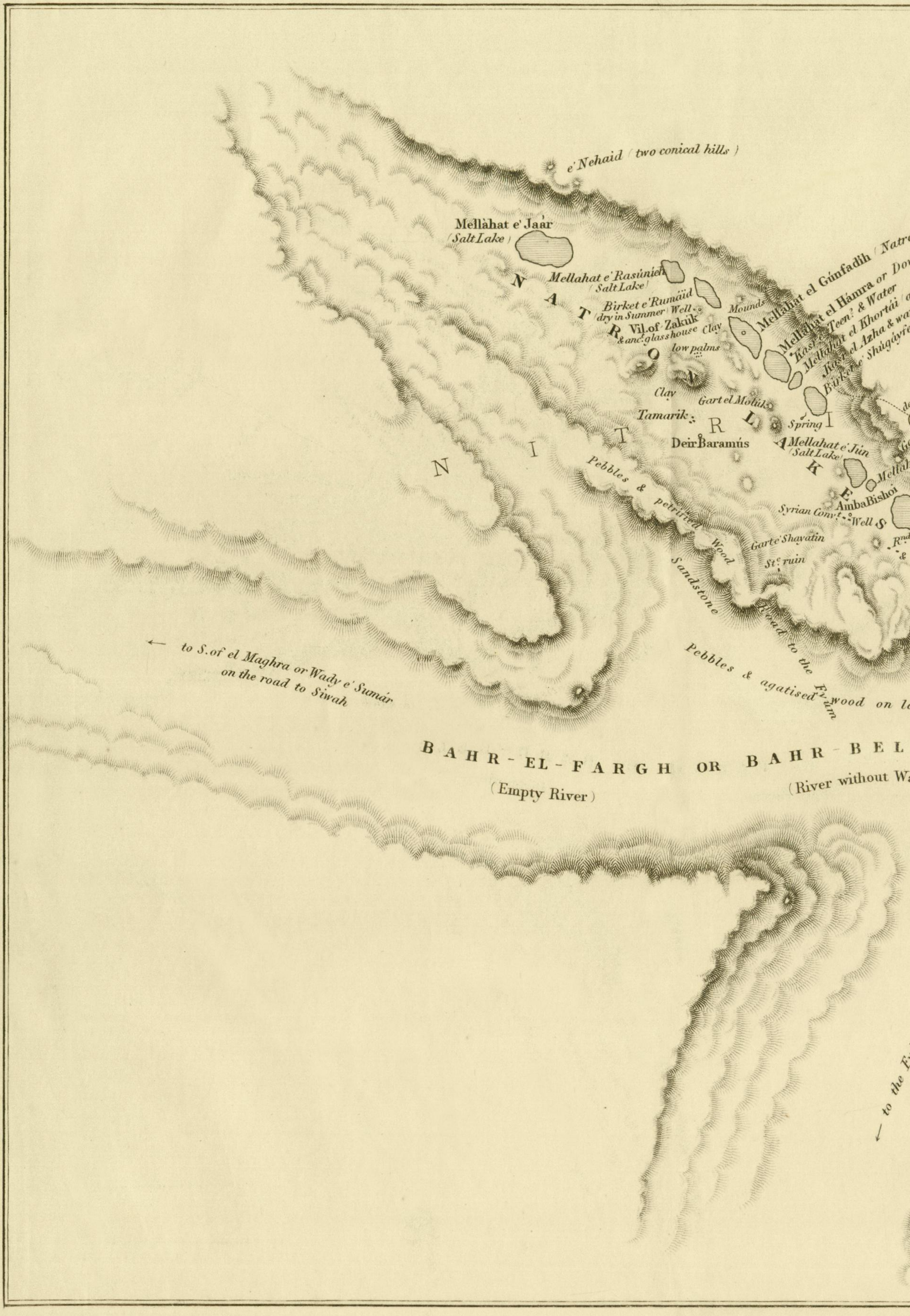
The Bahr-el-Fargh, or, as it is less frequently called, *Bahr-bela-ma,* runs towards El Maghra, or the Wady e' Sumar, on the Siwah road on one side, and to the back of the mountains at the western end of the Lake Meris on the other, and a branch also extends to the valley of the Nile, a little below Abú Roásh, 6 or 7 miles N. of the Pyramids of Gizeh. The hills that border it are indented here and there, as its bed is varied by numerous projecting ridges so as to deprive it of all the character of a river, which many have supposed it originally to have been. Some have even claimed it for the Nile, as an old bed of that river, seeing in the petrified wood found within its bed and on the adjacent hills the remains of boats that navigated this ancient channel. What had become of the alluvial deposit of this fertilising river they fail to tell us, and it is only surprising that they did not avail themselves of the clay on which the mountains repose to support their theory, though it might be difficult to explain the voluminousness of the superincumbent rocks intervening between this district and the valley of Egypt. But without requiring the aid of the Nile to form a valley unmarked by the most ordinary features of a river's course, we see in it the effect of a similar cause to that which at an early period formed other low Wadies in the Libyan desert, as its neighbour the Wady Natrún, the Oases, and other valleys also called *Bahr-bela-ma.* Really, if the Nile were called upon to account for all the depressions below its own level in the western desert, it would be justified in claiming for itself an antiquity and a power of ubiquity with which neither the age of the world nor the nature of rivers admits of.

In the construction of the accompanying map I have calculated the distance from the Nile, as before stated, by the pedometer and camel's pace; the two valleys are laid down by observed latitudes, by measured base-lines, and by a series of numerous triangles, and I only regret that my health would not allow me to follow the Bahr-el-Fargh to the Fyúm. It would be curious to trace its whole course, and every one might do this with a small escort of Arabs, whom it would be better to take from the Fyúm, and by turning aside or sending for water to the Natron Valley, the journey might be continued to the basis of Siwah, following the Wady-el-Fargh as far as the latitude of Wady e' Sumar, close to which it is said to pass.

That this small survey adds very little to our geographical knowledge of Egypt I willingly confess, and it may be unworthy of presentation to the Society; but I have thought it better to offer whatever geographical information is obtained by actual observation, however unimportant in itself, to show at least my wish to promote the object they have in view, while I regret my inability to offer matter more deserving of attention.

V.—*Routes in the Nizam's Territory.* From the Journals of Captain J. R. Wilson, of the Nizam's service.

[The following routes throw some light on the geography of a country of which less is known than might have been expected, considering the important military operations of which it has been the scene. They are extracted from the Journals kept by Captain Wilson in 1830 and 1831, when his regiment formed part of the "Hyderabad subsidiary force." Great part of these Journals is occupied with such historical, political, and military details as naturally had most interest for the author. The tabulated routes, with the remarks attached to them, are almost all that can be said to concern the geographer. The descriptions of Bolarum, Sekunderabad, and Hyderabad, have however also been extracted, from the lively idea they convey of the appearance impressed upon that region by the mixture of Europeans with the natives, and the mercenary troops collected by their chiefs from all regions of the East. The first route is that along which Captain Wilson marched in February, 1830, when his regiment was sent to occupy the station of Muktul. The other three routes traverse the territory on the Kistnah and Túmbudrah, in



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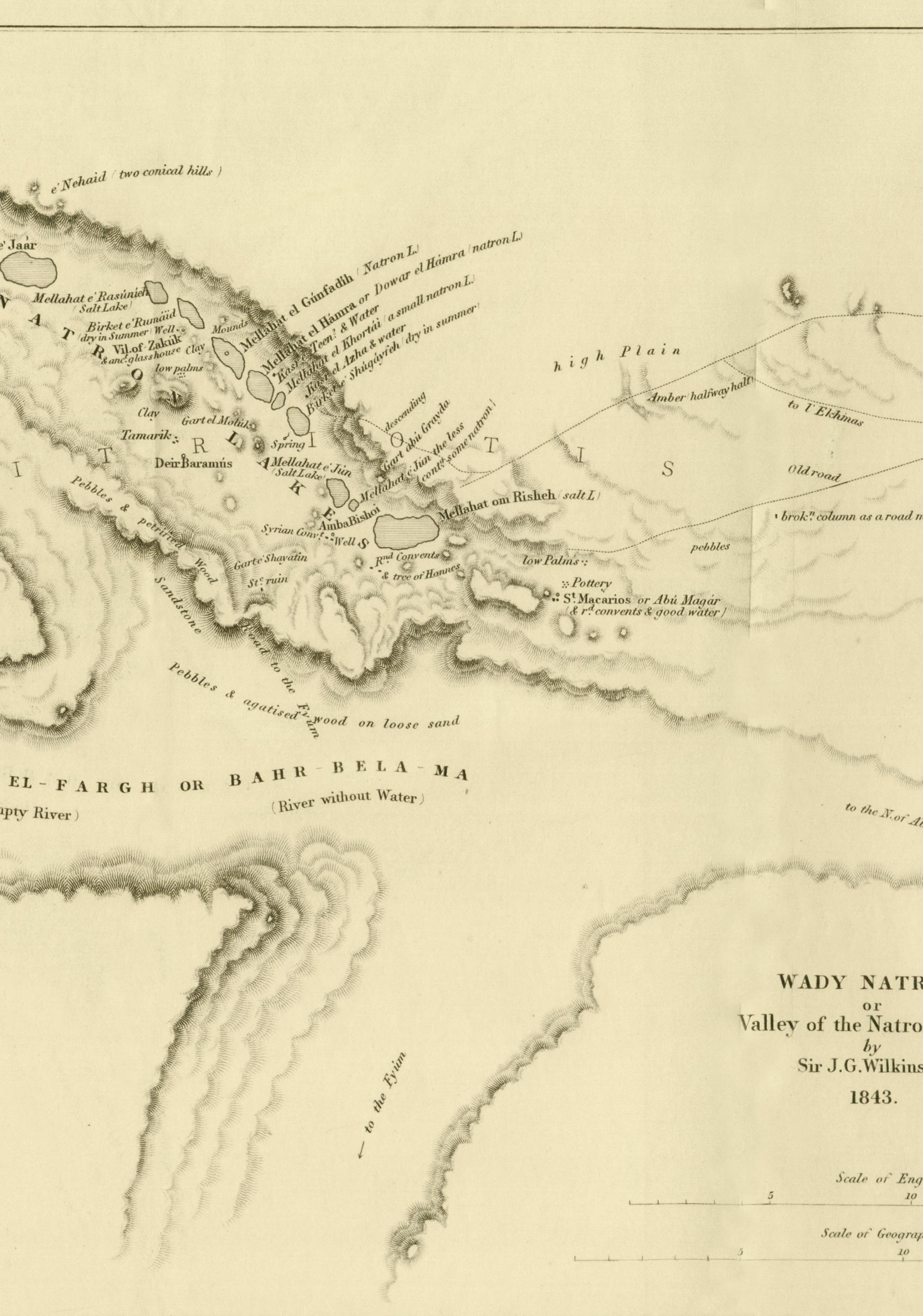
e'Nehaid (two conical hills)
e'Jaar
NATRON LAKES
Mellahat e'Rasúnieh (Salt Lake)
Birket e'Rumäid (dry in Summer)
Well
Vil. of Zakúk & anc.t glasshouse
Clay
Mounds
low palms
Mellahat el Gúnfadih (Natron L.)
Mellahat el Hámra or Dowar el Hámra (natron L.)
Kasr e'Teen? & Water
Mellahat el Khortái (a small natron L.)
Kasr el Azha & water
Birket e' Shúgáyfeh (dry in summer)
Clay
Gart el Molúk
Tamarik
Spring
Deir Baramús
Mellahat e'Jún (Salt Lake)
descending
Gart abú Grayda
Mellahat e'Jún the less (cont.g some natron)
NITRIOTIS
Pebbles & petrified Wood
Sandstone
Amba Bishoi
Syrian Conv.t
Well
Mellahat om Risheh (salt L)
Gart e'Shayatin
St.e ruin
R.nd Convents
& tree of Honnes
low Palms
Pottery
St. Macarios or Abú Magár (& r.d convents & good water)
high Plain
Amber halfway halt
to l'Ekhmas
Old road
brok.n column as a road m
pebbles
Road to the Fyúm
Pebbles & agatised wood on loose sand
EL-FARGH OR BAHR BELA-MA
pty River)
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Sir J.G.Wilkins
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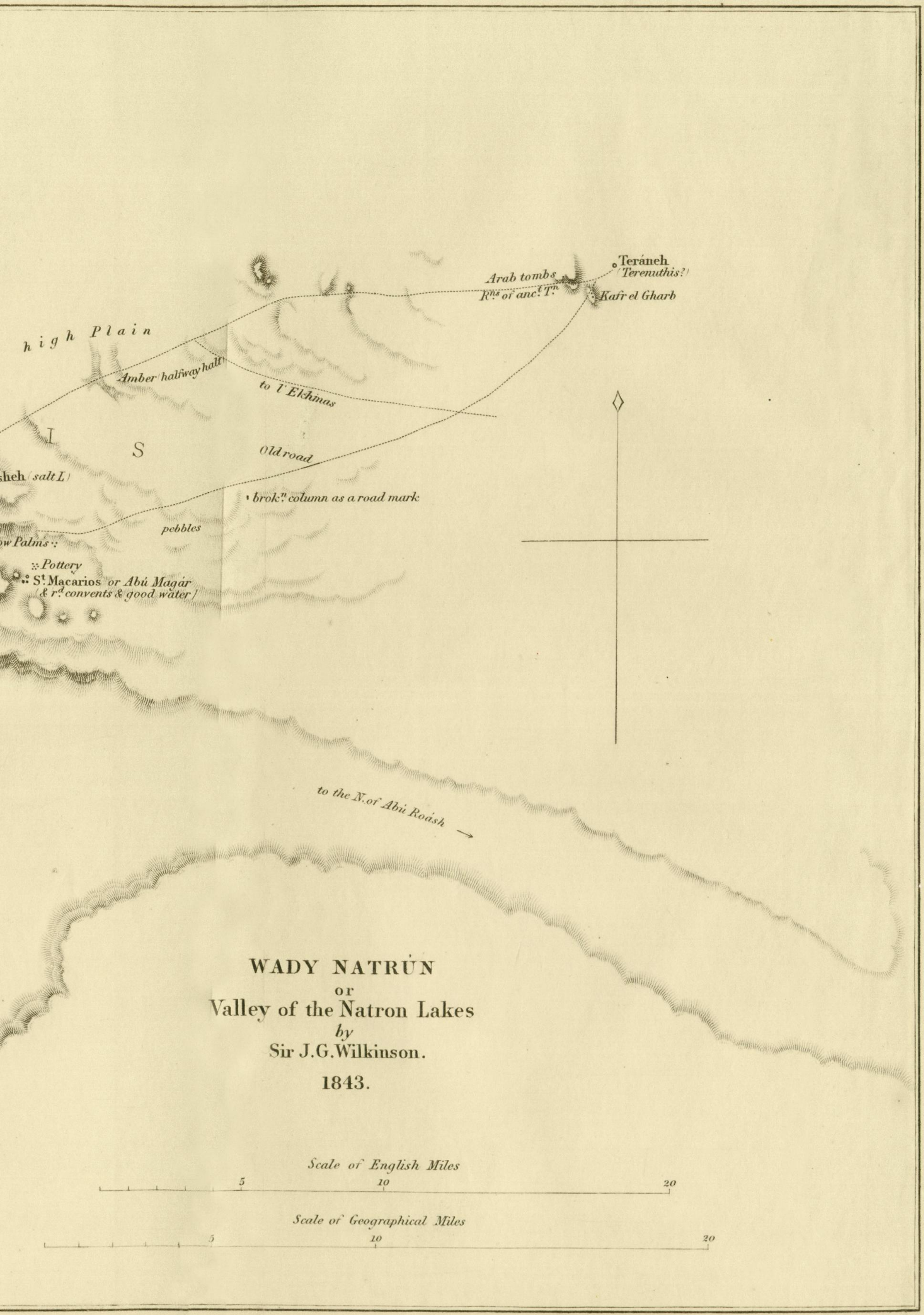

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John Arrowsmith.